Remarks

Status of the Application

The Office rejected Claims 1-21 under 35 U.S.C. § 102(e) as anticipated by *Rosenberg* (U.S. 6,259,382).

The Office rejected Claims 22-23 under 35 U.S.C. § 103 in light of *Rosenberg* and *Weis* (U.S. 6,353,850).

U.S. Patent 6,259,382 (*Rosenberg*)

Rosenberg teaches a force feedback interface having isotonic and isometric modes of operation. *See, e.g., Rosenberg* Abstract. The user is able to select one, but not both, of the two modes. *See, e.g., Rosenberg* col. 4 lines 23-24. According to *Rosenberg*, isotonic operation "provides input to a host computer based on a position of a cursor, and force sensations can be applied to the physical object based on **movement of the cursor**." *See, e.g., Rosenberg* Abstract (emphasis added). Isometric operation, on the other hand, provides input based on the force applied by the user to an input device held **essentially stationary**. *See, e.g., Rosenberg Abstract*; col. 4 lines 39-63.

Most of *Rosenberg's* teaching concerns specific two-dimensional device embodiments. *See, e.g.*, Figures 1-7, columns 5-25. The remainder of *Rosenberg* generally concerns specific two-dimensional user interfaces, including detail about specific force profiles, software implementations corresponding to the two-dimensional devices, and integration with existing planar window-based interfaces. *See, e.g., Rosenberg* Figures 8-16, columns 26-50.

The Office's proposed combination of scrolling (<u>isometric</u> in *Rosenberg*) with boundary detection (<u>isotonic</u> in *Rosenberg*) is contrary to *Rosenberg's* teaching.

The Office asserted that *Rosenberg* taught scrolling documents at col. 4 lines 54-59, and detection of cursor positioning near a boundary at col. 10 lines 29-33. The Office's rejections all rely on the combination of those two concepts. However, *Rosenberg's* teaching does not allow such a combination. As the Office noted, *Rosenberg's* mention of document scrolling is as an **isometric** function. Office Action par. 4; *Rosenberg* col.4, lines 54-59 ("The isometric function can include tasks such as scrolling a displayed document, ..."). *Rosenberg's* teaching related to cursors and boundaries relates only to **isotonic** operation of *Rosenberg's* invention. *Rosenberg* col. 10, lines 14-33 ("In the isotonic mode ..."). According to *Rosenberg's* teaching, isometric and isotonic control modes are **mutually exclusive**. *Rosenberg* col. 2 lines 3-42; *Rosenberg* col. 4 lines 23-24. Further, *Rosenberg* expressly teaches that isotonic control, or control of the position of an input device, is not suitable for rate control operations such as scrolling. *Rosenberg* col. 2 line 43 – col. 3 line 16. Accordingly, the combination proposed by the Office – scrolling, taught by *Rosenberg* as an **isometric** function, and boundary detection, taught by *Rosenberg* as an **isotonic** function – is contrary to *Rosenberg's* teaching.

All the Claims involve changing the display of an item responsive to cursor positioning relative to a boundary, a combination not taught or suggested by *Rosenberg*. Accordingly, Applicant submits that there is no *prima facie* case of anticipation or obviousness of any of the present Claims. Applicant discusses below specifics of each Claim.

Claim 1, and Claim 2-5 and 17 depending therefrom.

Claim 1 recites limitations related to determining a position of a cursor relative to a boundary, and then changing the display of an item based on a force applied by the user to an input device. *Rosenberg* teaches that scrolling can be accomplished as an **isometric** function – holding the cursor motionless while sensing input force. *Rosenberg* does not teach any scrolling that is related to motion of a cursor. Accordingly, *Rosenberg* does not teach all the limitations of Claim 1, and there is no *prima facie* case of anticipation of Claim 1. Claims 2-5 and 17 depend from Claim 1, and accordingly are also in condition for allowance. *See* MPEP 2143.03; *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

Additionally, Claim 5 recites limitations that scrolling is disabled in certain directions when certain portions of the documents are displayed. The Office cited no teaching in *Rosenberg* relative to these limitations, but asserted that this was inherent in scrolling. Applicant respectfully traverses this assertion. Disabling scrolling is not inherent in a scrolling operation; as examples, some scrolling operations wrap around when a document end is reached, some scrolling operations move to another document when a document end is reached.

Claim 6, and Claims 7 and 18 depending therefrom.

Claim 6 recites limitations involving haptic boundaries established approximately coincident with visual boundaries in the display, and scrolling based on the relationship of a cursor position to such boundaries. *Rosenberg* teaches scrolling only as an isometric function – the cursor position is fixed, and the document scrolled based on forces applied by the user. *Rosenberg* col. 4 lines 45-51. *Rosenberg* accordingly has no teaching of scrolling based on cursor motion relative to a haptic boundary. Not surprisingly, *Rosenberg* has no mention of establishing haptic boundaries for scrolling anywhere, and certainly no mention of establishing haptic scrolling boundaries approximately coincident with visual boundaries in the display. Accordingly, *Rosenberg* does not teach all the limitations of Claim 6, and there is no *prima facie* case of anticipation of Claim 6. Claims 7 and 18 depend from Claim 6, and accordingly are also in condition for allowance. *See* MPEP 2143.03; *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

Claim 8, and Claims 9-14 and 19 depending therefrom

Claim 8 recites limitations involving the provision of a control portion of a haptic space, and changing the display of an item responsive to positioning of a cursor relative to boundaries of the control portion. A control portion is a subset of the haptic space, where the user can use motion and force to control the display of an item. *Rosenberg* teaches scrolling only as an isometric function – the cursor position is fixed,

and the document scrolled based on forces applied by the user. *Rosenberg* col. 4 lines 45-51. *Rosenberg* accordingly has no teaching of scrolling based on cursor motion relative to a haptic boundary in a control portion of a haptic space. Not surprisingly, *Rosenberg* has no mention of establishing haptic boundaries for scrolling anywhere, and certainly no mention of establishing haptic scrolling boundaries as part of a control portion of a haptic space. Accordingly, *Rosenberg* does not teach all the limitations of Claim 8, and there is no *prima facie* case of anticipation of Claim 8. Claims 9-14 and 19 depend from Claim 8, and accordingly are also in condition for allowance. *See* MPEP 2143.03; *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

Additionally, Claim 10 recites a limitation that the control portion be activated responsive to direction of the user. The Office asserted that *Rosenberg* taught such a limitation at several places. Applicant respectfully traverses this assertion. A "control portion" as used in Claim 10 involves a subset of a haptic space. *Rosenberg* teaches user direction to select between isotonic and isometric modes of operation, but nowhere does *Rosenberg* teach activation of a portion of a haptic space to serve as a scrolling control portion. Further, detecting motion of a cursor relative to a control portion is contrary to Rosenberg's teaching of scrolling as an isometric function.

Additionally, Claim 11 recites a limitation involving motion of a haptic cursor and determination of whether that motion places the cursor within a control portion. As discussed above, *Rosenberg* teaches selection between isometric and isotonic control modes, but, contrary to the Office's assertion, has no mention of control portions of a haptic space, at the sections cited by the Office or anywhere else. Further, detecting motion of a cursor relative to a control portion is contrary to *Rosenberg's* teaching of scrolling as an isometric function.

Additionally, Claim 12 recites a limitation involving user direction to move the cursor into a control portion. As discussed above, there is simply no mention in *Rosenberg* of a control portion of a haptic space – *Rosenberg* allows a user to move a cursor while in isotonic mode, and allows scrolling in isometric mode, and teaches the two modes as mutually exclusive. Accordingly, "mov[ing] a cursor into the control portion" as recited in Claim 12 is meaningless in the context of *Rosenberg's* teaching.

Additionally, Claim 13 recites a limitation involving haptic boundaries separating the control portion from the rest of the haptic space. The Office's citation to *Rosenberg* is to a teaching of haptic boundaries, but there is not mention of those boundaries having any relation to a control portion or scrolling – not surprising since *Rosenberg* has no mention of a control portion of a haptic space.

Claim 15

Claim 15 recites limitations involving establishment of a scrolling zone near the edge of a document display, and scrolling based on a determination of the distance of a moveable cursor from the ends of the scrolling zone. As discussed above, *Rosenberg* mentions scrolling only as an isometric function – scrolling

is based on user-applied force relative to a locally defined origin (i.e., the user can push or pull on a single point in space). In contrast, Claim 15 recites scrolling based on position of a cursor relative to a range of possible cursor positions. *Rosenberg's* teachings related to boundaries and zones are taught as part of isotonic control modes, which are not taught as applicable to scrolling. Accordingly, *Rosenberg* does not teach or suggest all the limitations of Claim 15, and there is no *prima facie* case of anticipation of Claim 15.

Claim 16

Claim 16 recites limitations involving interaction with a document in one control mode, and involving changing the display of a document responsive to the position of a cursor relative to a haptic boundary. *Rosenberg* teaches two control modes: isotonic and isometric. *Rosenberg* does not teach selection between a document interaction mode and a display change control mode. As discussed above, *Rosenberg* does not teach changing the display of a document based on cursor position – *Rosenberg* only mentions scrolling a document based on isometric control (fixing the position of a cursor, then detecting forces applied by the user). Accordingly, *Rosenberg* does not teach or suggest all the limitations of Claim 16, and there is no *prima facie* case of anticipation of Claim 16.

Claim 21

Claim 21 recites limitations involving changing the display of a document according to the position in three dimensions of a moveable cursor. As discussed above, *Rosenberg* mentions scrolling only in isometric control; *Rosenberg* has no mention of scrolling based on position of a moveable cursor. Further, Claim 21 recites a limitation involving a three dimensional control zone. Since *Rosenberg* has no mention of a control zone portion of a haptic space, and no mention of changing a display based on motion of a cursor relative to such a control zone, it is not surprising to find no mention of three-dimensional control zones in *Rosenberg*. Accordingly, *Rosenberg* does not teach or suggest all the limitations of Claim 21, and there is no *prima facie* case of anticipation of Claim 21.

Claims 22 and 23

The Office combined *Rosenberg* with *Weis* in its rejection of Claims 22 and 23. Claims 22 and 23 depend from and further define the invention of Claim 21. As discussed above, *Rosenberg* does not have the teaching relied on by the Office in its rejection, and Claims 22 and 23 are allowable for the same reasons as Claim 21.

The Office asserted that combining *Rosenberg* with *Weis* produced the invention of Claims 22 and 23. Applicant respectfully traverses. Specifically, the Office asserted that *Weis* taught "scrolling a document" at col. 14, lines 23-37. *Weis* only mentions that portions of web pages can be scrolled; Applicant readily admits that document scrolling is known. However, *Weis* does not teach that movement of a cursor relative to a control zone can be used to control scrolling, or control zones arranged as recited in Claims 22 and 23.

The Office further asserted that *Weis* taught a "control area" at col. 14, lines 48-59. *Weis* does have those words, but *Weis's* control area is not the same as the control zone of Claims 22 and 23. Weis's control area is a portion of web page where controls such a buttons are presented. *Weis* does not teach a control zone such as in Claims 22 and 23, where the user can move a cursor relative to the control zone to control operations such as scrolling. Further, the Office asserted that the combination of *Rosenberg* and *Weis* would be obvious to allow a user to feel when a cursor is near to an "interesting" object. Regardless of whether this is true, such a combination does not produce the invention of Claims 22 and 23. Claims 22 and 23 concern a control zone that allows a user to intuitively control operations such as scrolling; the presence of "interesting" objects is not relevant to Claims 22 and 23.

Further, Claim 22 recites limitations involving a specific arrangement of zones in a three-dimensional haptic space. The control zone of Claim 22 has an entry region and an active region, where the z coordinates of the entry region are different from those of the active region. This arrangement allows a user to move a haptic cursor into an active region by moving it over or under simulated walls of an active region, illustrated schematically in Applicant's Figure 3b. The Office made no indication of where such a control zone arrangement could be found in *Weis* or *Rosenberg*. In fact, neither of the references teach control zones as used in Claim 22, and certainly do not teach the specific arrangement recited in Claim 22. Accordingly, the references do not teach or suggest all the limitations of Claim 22, and there is no *prima facie* case of obviousness of Claim 22.

Further, Claim 23 recites a specific control zone arrangement wherein the control zone comprises a subset of the z dimension of the range of motion of a haptic input device. This arrangement allows a user to move the input device to a defined region of its range of motion to control operations such as scrolling, while still allowing full interaction in the remainder of its range of motion. As an example, the user could interact with a document while the input device is in a subset of its range of motion corresponding to the region where a user would normally employ a pen. Moving the haptic input device such that the pen is a defined distance from the simulated page could then be used as a control zone, allowing haptic control of scrolling without any special controls or buttons. The Office made no indication of where *Weis* or *Rosenberg* taught the use of a subset of the z dimension as a control zone. In fact, neither of the references teach such a concept. Accordingly, the references do not teach or suggest all the limitations of Claim 23, and there is no *prima facie* case of obviousness of Claim 23.

Conclusion

Applicant has responded to each and every rejection and urges that the Claims as presented are in condition for allowance. Applicant requests expeditious processing to issuance.